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Toward a Typological Theory of Information System Project Team Management Styles

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ABSTRACT

Drawing from research in information systems (IS) and project management, the contingency perspective research stream and from empirical observations, the present paper investigates the effect of the fit between information system project team management (ISPTM) styles and four IS project risk profiles, i.e. challenging, diplomatic, technical and easy (cookie cutter), on IS project performance. Following recommended survey development approaches, distribution practices and general conduct of survey research, questionnaire data was obtained from182 IS project managers in Canada and the United States. The results show that IS project managers adapt their ISPTM to the context specificities and that, for each IS project risk profile, there are significant differences between ISPTM styles deployed in successful and less successful IS projects.

Keywords

IS project management, team, management styles, typology, and typological theory.

INTRODUCTION

Today's organizations innovate and improve their business processes and activities by relying on novel information systems (IS) (Tiwana and Keil 2006). Such IS are typically developed and implemented by means of transitory ventures known as IS projects (ISP) (Kirsch 2000). ISP are temporary organizations that exist within organizations for as long as it takes to complete the specific tasks they are assigned or to attain particular objectives (Lundin and Söderholm 1995). Led by project managers, ISP are typically carried out by project teams which play a key role in their performance (Faraj and Sambamurthy 2006). Usually, ISP show structural variations when compared to their parent organizations (Shenhar 2001) and one of the key roles of project managers is to establish "… a team structure where no discernible structure exists" (Frame 1995, p.105).

Over the last decades many project management studies have focused on (1) developing and improving project management tools and techniques (e.g. Besner and Hobbs 2008) and (2) examining how specific project management processes affect project outcomes (e.g. Byosiere and Luethge 2007). However, little research has focused on the approaches/strategies deployed by project managers to manage ISP team (ISPT) and, to the best of our knowledge, no conceptual model currently exists that enables project managers to "understand why different approaches exist, which one to choose, and when" (Pich et al 2002, p.1008). There is also a need to develop success-focused typologies of project management styles and how they can be applied in ISP (Thomas and Fernández 2008).

Drawing from research in IS, project management and the contingency perspective, this paper seek to develop a typological theory of ISPTM based on the premise that ISP performance is influenced by the fit between the ISP's risk and the ISPTM style deployed. The following research questions are addressed in this exploratory study using a survey approach: Do different ISPTM styles exist? And if so, are some styles better suited for certain types of ISP risks? The results suggest that different ISPTM styles exist and were conceptualized here as configurations of different key ISPT processes and governance attributes. Further, the results also suggest that, depending on the ISP's risk profile, a project manager is likely to adapt his management style, and that different ISPTM styles were deployed in successful ISPs compared less successful projects.

THEORETICAL BACKGROUND – The Construct of IS Project Team Management and Typological Theories

While projects occupy an important place in both the management and IS fields, and despite extensive research efforts deployed over the years, delivering expected benefits of ISP continues to be a difficult endeavor (Nelson 2007). ISP involve the execution of both technical and managerial activities, and ISP managers face predominantly

managerial challenges, especially related to the ISPT (Faraj and Sproull 2000). These challenges stem from the ISP and ISPT specificities which include their cross-functional nature; their task uncertainty and need for knowledge sharing; the distributed and multidisciplinary nature of team members' expertise and knowledge; the need for team members to collaborate and coordinate with each other and with other project stakeholders; the complex and rapidly changing nature of the technology; and their focus on designing an IS that is abstract and configurable (Boehm and Turner 2004; Mahring 2002). Given the organizational impacts of ISPs and ISPT, the challenges associated with managing ISPTs, and the key roles they play on ISP performance, a better understanding of ISPT management (ISPTM) is needed (Faraj and Sambamurthy 2006; Hoegl and Gemuenden 2001).

Our conceptualization of ISPTM is depicted in Figure 1 (Bourdeau 2012; Bourdeau and Barki 2010) and is based on two fundamental elements of projects in general, and ISP in particular: *project team processes* and *governance attributes*. In essence, we view ISPTM as reflecting the manner in which key ISPT processes are governed, and conceptualize it as a multidimensional profile construct (Law et al. 1998) where three ISPT process categories, i.e. transition/planning, action, and interpersonal, are characterized by four ISPT governance dimensions, i.e. participative, decisional, procedural, and regulative. The three ISPT process categories were drawn from the taxonomy of team processes proposed by Marks et al. (2001) which we adapted to ISP contexts. These processes describe the interdependent acts of team members which convert inputs to outcomes and reflect the fundamental activities that enable ISPT to align, direct and monitor their taskwork[3] (Marks et al. 2001). The four ISPT governance dimensions characterize how different processes can be structured and executed, i.e., the different ways in which ISPT activities can be deployed to align, direct and monitor the taskwork. They were identified based on a literature review (for details, see Bourdeau 2012). Finally, the three ISPT process categories and four ISPT governance dimensions were combined within a multidimensional profile model to complete the proposed conceptualization of ISPTM. Figure 2 depicts the ISPTM construct.

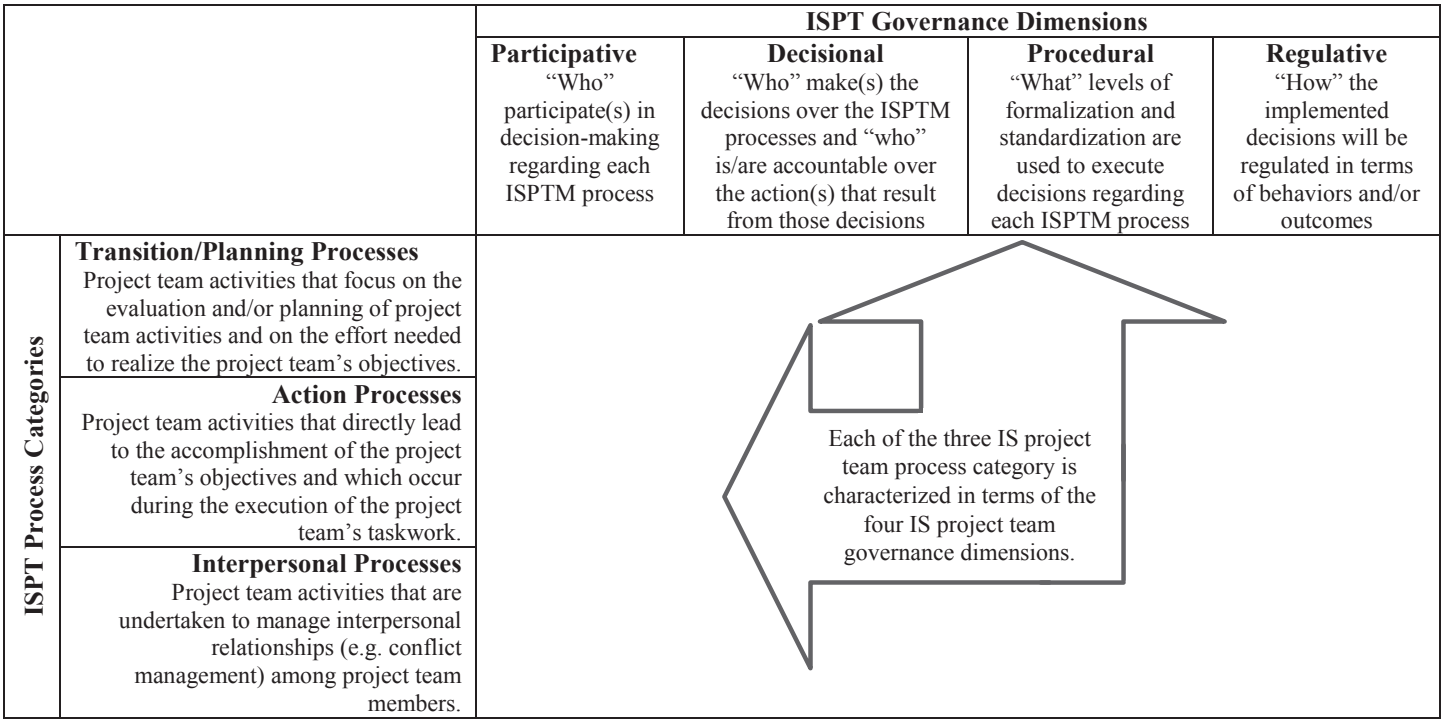

Figure 1. Conceptualization of Information Systems Project Team Management

[3] Taskwork represents "… what is that teams are doing" (Marks et al, 2001, p.357), whereas the team processes describe "… how they are doing with each other (p.357)".

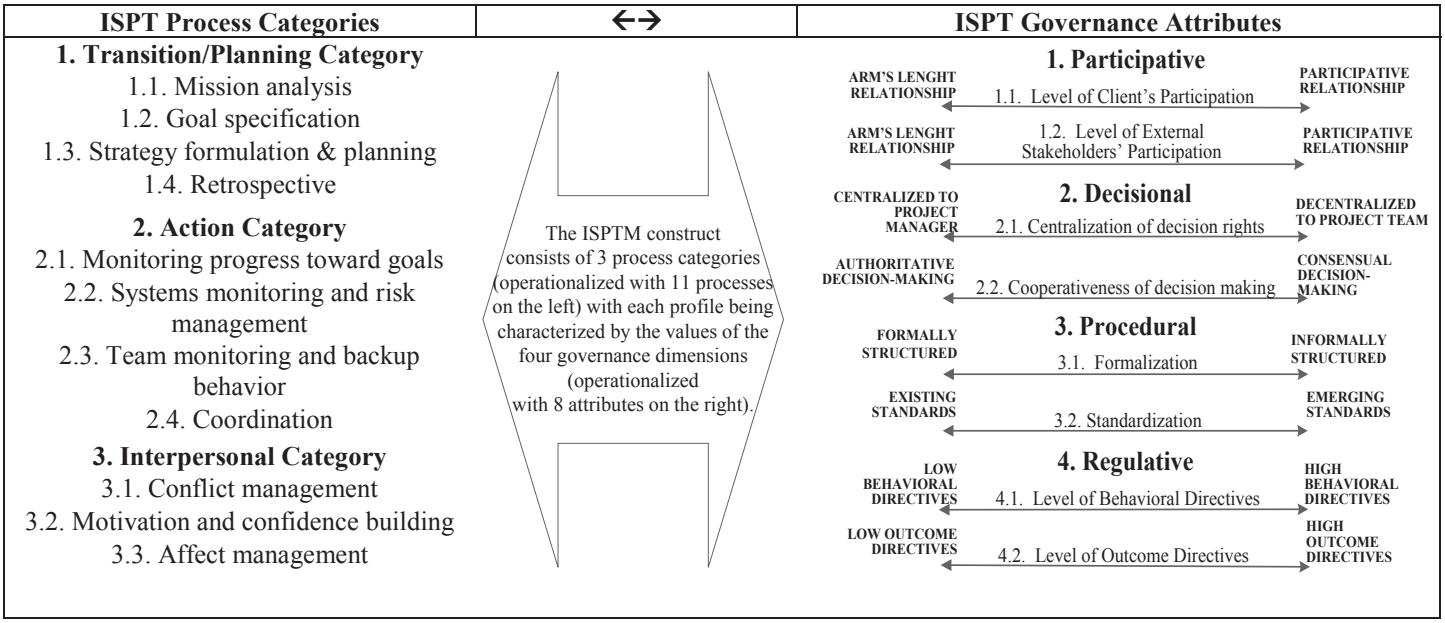

Figure 2. The Information Systems Project Team Management Construct

Toward a Typological Theory of IS Project Team Management

The notion of "management style" is defined here as "…an underlying mode of thinking and behaving that in turn promotes a specific repertoire of actions that managers draw upon in contexts of varying complexity and uncertainty" (Lewis et al. 2002, p.546). In order to describe ISPTM styles, and its influence on ISP performance, several researchers advocate the development of typologies and typological theories (Short et al. 2008).

A typology identifies multiple archetypes or ideal types which are "…complex constructs that can be used to represent holistic configurations of multiple unidimensional constructs" (Doty and Glick 1994, p.233). Typological theories identify the pathways connecting particular archetypes to specific outcomes, such as project performance, whose variance they are intended to predict (George and Bennett 2005). They differ from traditional theories, since they do not "... highlight the hypothesized relationships between the unidimensional first-order constructs and the dependent variable(s)" (Doty and Glick 1994, p.234). Instead, their focus is on the internal consistency and synergetic effects among the first-order constructs within each archetype (Delery and Doty 1996).

In a typological theory, archetypes must be defined by specifying, empirically and/or theoretically, multivariate profiles (George and Bennett 2005). Usually, greater similarity between an empirical manifestation and an archetype will engender greater effectiveness because factors are thought to be consistent within each archetype (Doty and Glick 1994). In the context of ISP, the correspondence between ISPTM styles (or archetypes) and the ISPTM styles deployed by project managers in actual ISPs can be modeled in terms of profile deviation (Doty et al. 1993; Venkatraman 1989).

The development of an ISPTM typological theory requires the identification of pathways that connect ISPTM styles to specific outcomes. While there is no such thing as a "correct" ISPTM style, some styles are likely to better fit particular project characteristics (Shenhar 2001). In a typological theory, archetypes have to be conditional to certain contingency factors (Doty and Glick 1994) and these factors restrict the number of possible archetypes. Thus, a deviation analysis can be conducted to identify, in the presence of specific contingencies, the most appropriate ISPTM styles (George and Bennett 2005).

RESEARCH MODEL - IS Project Risk and a Contingency Model

The underlying logic of structural contingency theory is that organizational performance is influenced by the fit between task uncertainty and an organization's ability to structure and execute its activities in ways to cope with this uncertainty (Galbraith 1977; Lawrence and Lorsch 1967). This suggests that contingencies, such as project

uncertainty or risk[4], faced by an ISP are likely to influence the best ways in which to structure and execute different ISPT processes in order to increase project performance (Gresov 1989). In this context, it is important to note that project risk has been recognized as a key contingency factor that needs to be taken into consideration when managing ISP (Schmidt et al. 2001). For example, project risk has been found to influence how ISP are managed (Jiang et al. 2001a) and risk factors represent multiple contingencies which can affect ISPs' execution and performance (Gemino et al. 2007-8). ISP managers who matched their management approaches/strategies with ISP risks have been found to increase project performance (Barki et al. 2001). Clearly identifying an ISP's risks prior to its start and during its execution can provide a means to select the most appropriate managerial strategy or style (Jiang et al. 2001b). For example, Ropponen and Lyytinen (2000) found that a general managerial strategy, such as ISP management, was more effective than risk management techniques in mitigating ISP risks. Such results are also consistent with work which views risk management and project management as being analogous (McFarlan 1981; Wallace et al. 2004a).

However, much of past research has examined ISP management and ISPTM strategies in isolation rather than as configurations which some researchers have suggested (e.g. Kirsch 2000). The ISPTM construct (Figure 2) can be viewed as a set of interconnected managerial strategies, i.e. various configurations of ISPTM processes and attributes, which can be structured and executed differently depending on the risks of a particular ISP in order to achieve better performance (Wallace et al. 2004a). Based on these considerations and contingency theory, our premise is that ISP performance will be likely depend on the "fit" between ISPTM styles and ISP risks (Figure 3).

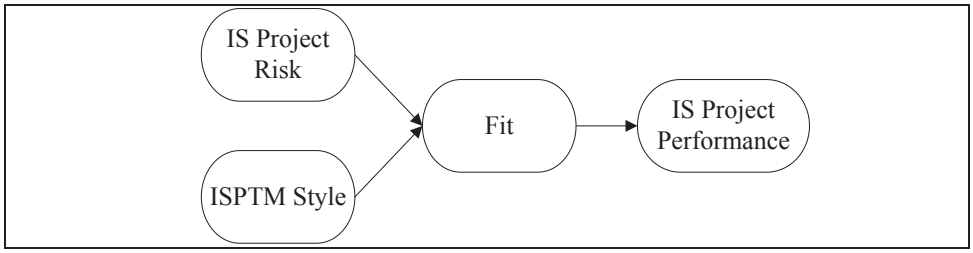

Figure 3. A Contingency Model of IS Project Team Management

Four IS Project Risk Profiles

In the IS literature, researchers have identified various ISP risk factors which need to be identified and controlled in order to reduce the likelihood of project failure (Sherer and Alter 2004). Various risk checklists and classification frameworks have been proposed (e.g. Schmidt et al. 2001) but this multiplicity of frameworks and checklists renders their integration and comparison of risks difficult. A useful approach to address these limitations is to categorize risk as either social or technological (e.g. Mathiassen et al. 2007). These two risk dimensions represent complementary aspects of ISP risks and are consistent with the sociotechnical system theory which emphasizes the fit between social and technical subsystems (Trist 1981). As such, the two dimensions can be used to define a matrix of four ISP risk profiles (Figure 4) which can yield more interpretable and theoretically interesting patterns than any risk element taken in isolation (Rousseau and Fried 2001).

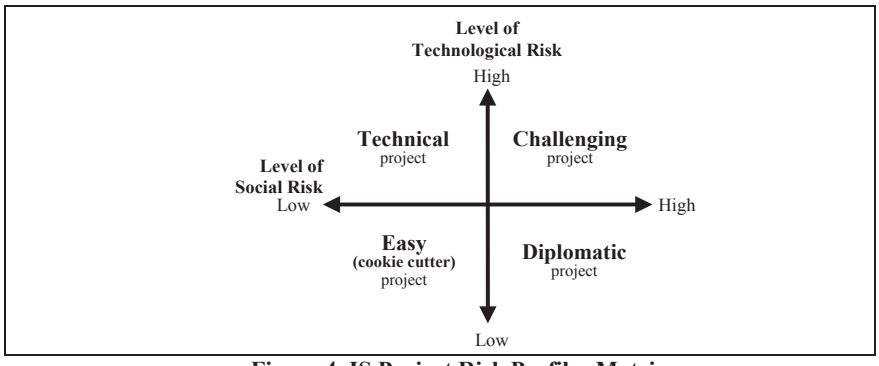

Figure 4. IS Project Risk Profiles Matrix

[4] As noted by Barki et al. (2001), "… strong parallels have been shown to exist in the meanings attributed to these terms (i.e. uncertainty and risk) in the IS literature, with both terms used to describe project characteristics that tend to increase the probability of project failure (p.43)."

Information Systems Project Team Management and Fit

Several researchers have observed that the characteristics of the ISP itself influences the selection and use of risk management strategies (e.g. Martin 2003; McFarlan 1981). Past research has suggested that ISP performance is influenced by the fit between ISP risks and the management strategies deployed by project managers (Barki et al. 2001). Thus, based on contingency theory (Galbraith 1977), it can be hypothesized that different ISPTM styles will be better suited for different ISP risk profiles (Figure 4) and that the degree of fit between the ISPTM style and the ISP risk profile will be likely to influence project performance.

When adopting a contingency approach, the conceptualization of fit should be clearly defined because each conceptualization implies different meanings (Venkatraman 1989). Given our objective to explore the effect of the fit between ISPTM styles and ISP risk profile on performance (i.e. criterion-specific), fit as profile deviation seems to provide an appropriate conceptualization (Venkatraman 1989). The profile deviation approach allows researchers to empirically assess complex and multidimensional relationships that are more consistent with a holistic perspective than traditional approaches (Meyer et al. 1993). In the present study, ISPTM fit is defined as the degree to which an ISPTM style is appropriate for a specific ISP risk profile. The next section describes the research methodology that was used to examine the effect of the fit between ISPTM styles and ISP risk profiles on project performance.

METHODOLOGY - Survey

As described below, following recommended survey development approaches, distribution practices and general conduct of survey research (e.g. Dillman et al. 2008; Furneaux and Wade 2011; Ju et al. 2006) a paper questionnaire was developed and distributed to a cross-section of ISP managers in Canada and the United States.

Construct Definitions. A first step was to clearly define the study's key constructs, i.e. (1) ISPT processes and (2) ISPT governance attributes. Data were collected for the ISPT process categories, i.e. transition/planning, action and interpersonal (Figure 2), rather than for each of the eleven ISPTM processes since the study was exploratory and that assessing all eleven processes would have required more than 300 items, tripling the questionnaire's length and completion time. As recommended by Marks et al. (2001), the higher order process categories were used as representative of their underlying lower-order processes. Each was defined based on the definitions of the 11 ISPT processes (see Table 2). The ISPT governance attribute definitions are provided in Table 3 (Bourdeau 2012).

ISPTM Process Categories	Definitions
Transition/ Planning Processes	The transition/planning processes refer to project team management activities which focus on the evaluation and/or planning of a project and on the effort needed to realize the project's team objectives: (1) mission analysis, (2) goal setting, (3) strategy formulation, (4) work planning, (5) team creation and (6) project evaluation and review.
Action Processes	The action processes refer to project team management activities that directly lead to the accomplishment of the project's team objectives and which occur during the execution of the project team's tasks: (1) monitoring the project's progress, (2) controlling the project's resources, (3) managing project risk, (4) coordinating people and activities and (5) sharing information.
Interpersonal Processes	Interpersonal processes refer to project team management activities that are undertaken in order to manage interpersonal relationships among the stakeholders of an IT project: (1) conflict management, (2) team-building, (3) trust development, (4) motivation building, (5) cohesion establishment, and (6) social integration.

Table 2. Definitions of ISPT Process Categories

ISPT Governance Attributes	Definitions
1.Centralization of decision rights	The pattern of decision rights allocation between the project manager and the project team, regarding decisions about an ISPT process.
2. Cooperativeness of decision-making	The pattern of accountability, between the project manager and the project team, about the action(s) related to ISPT processes and resulting from decisions.
3. Level of Formalization	The extent, to which an ISPT process is written, documented, explicitly formulated and/or scheduled.
4. Level of Standardization	The extent to which the norms and evaluation criteria of the execution of a given ISPT process are codified in a pre-specified standard.
5. Level of Behavioral Directives	The extent to which detailed information about the execution of a given ISPT process is provided.
6. Level of Outcome Directives	The extent to which detailed information about the outcomes of a given ISPT process is provided.
7. Level of Client Participation	The extent to which the ISP client participate in ISPT process decisions.
8. Level of External Stakeholder Participation	The extent to which key external stakeholders of the ISP participate in ISPT process decisions.

Table 3. Definitions of ISPT Governance Attributes

Identifying Respondents. ISP managers were deemed to be the most appropriate respondents as they are typically the individuals who are most knowledgeable about the processes, decisions and risks associated with the projects they manage. In order to minimize memory bias (Lechler and Dvir 2010), the respondents were asked to select two recently completed projects (one successful and one less successful) that were relatively fresh in their mind. The first part of the questionnaire contained questions about a project the respondent had recently managed and that they thought had been *successful* in terms of project budgets and schedules, whereas the second part asked the same questions, but for a different project that the respondent viewed as having been *less successful than the first project.* The questionnaire items pertained to the ISPTM styles deployed (unit of analysis) by the project manager, the ISPs' risk profiles and the performances.

Questionnaire Development

ISP risk was measured with 17 items[5] from Wallace et al. (2004a; 2004b) and performance was measured with four items from Gemino et al. (2007-8). ISP satisfaction was assessed with five items developed from Turner and Müller's (2006) items, whereas ISPTM style items were created in accordance with their construct definitions, as described below.

ISPTM Styles. The definitions of the ISPT process categories and governance attributes served as a starting point for developing items. First, the conceptual definitions were examined to identify their key elements. For the ISPT processes, the original process category (Marks et al. 2001) and the operationalizations suggested by other researchers (e.g. Morgeson et al. 2010) were also reviewed. For the ISPT governance attributes, the definitions of Bourdeau (2012) and the operationalizations proposed by other researchers (e.g. Faraj and Sambamurthy 2006) were reviewed. Next, based on the definitions, items were created to assess the extent to which the structure and execution of each ISPT process category was characterized by the eight ISPT governance attributes. Likert scales (1= "Not at all" to 7= "To a great extent"), were used to measure most governance attributes (Table 4).

[5] Due to space limitations, the detailed questionnaire is not included here, but can be provided on demand.

1. **Centralization of decision rights:** In your SUCCESSFUL IT project, how were the organizational decision rights shared between you, the project team members and the other project stakeholders with respect to *transition/planning activities*?
   Please provide a percentage representing the degree of responsibility of each group regarding the *transition/planning activities*. (The total of the three percentages should be 100%).
   a. With regards to *decisional rights*, YOU were responsible of what percentage of the *transition/planning activities*:
   b. With regards to *decisional rights*, the project team members were responsible of what percentage of the *transition/planning activities:*
   c. With regards to *decisional rights*, the other project stakeholders were responsible of what percentage of the *transition/planning activities:*
2. **Cooperativeness of decision making**: In your SUCCESSFUL IT project, to what extent were *the project team members* involved in the *decision-making process* regarding the *transition/planning activities*:
3. **Level of formalization**: In your SUCCESSFUL IT project, to what extent were the *transition/planning activities* written, explicitly formulated and documented:
4. **Level of standardization**: In your SUCCESSFUL IT project, to what extent were pre-existing guidelines (e.g. standards, reference documents, methodologies, evaluation criteria, etc.) used to manage the *transition/planning activities*?
5. **Level of behavioral directives** : In your SUCCESSFUL IT project, to what extent did you provide detailed instructions to project team members on how to perform the *transition/planning activities*:
6. **Level of outcomes directives** : In your SUCCESSFUL IT project, to what extent did you ask that project team members attain specific objectives regarding *transition/planning activities*:
7. **Level of client participation:** In your SUCCESSFUL IT project, to what extent were representatives of the project's clients involved in the management of the *transition/planning activities*:
8. **Level of external stakeholder participation:** In your SUCCESSFUL IT project, to what extent were representatives of the project's external suppliers involved in the management of the *transition/planning activities*:

*The example provided here is related to the transition/planning activities realized in the successful IT project. The same logic was applied for the action and interpersonal activities in both the successful and less successful ISP.

Table 4. Examples of ISPTM Style Items*

ISP Risk Profiles. Each ISP risk profile was characterized based on the profile model (Law et al. 1998). This approach is consistent with Iversen et al.'s (2004) risk-strategy models which relate risk configurations to specific patterns of resolution techniques. Thus, ISP risk profiles were assessed along two distinct risk dimensions: technological risk and social risk, via the 17 risk items of Wallace et al. (2004a; 2004b).

ISP Performance. According to Nelson (2005), ISP performance should be evaluated on process and outcome criteria, as well as on satisfaction since the main objective of the project manager should be to maximize stakeholder satisfaction. We assessed ISP performance via four outcome and process measures adopted from Gemino et al. (2007-8) and the satisfaction measure of Turner and Müller (2006).

Pretest, sampling and distribution. A draft questionnaire was created, pretested with four experienced ISP managers and revised based on their comments and suggestions. The initial sampling frame was based on personal and professional contacts and was completed via a snowball sampling approach (Salganik and Heck 2004). The questionnaires were distributed following the principles of the tailored design method (Dillman et al. 2008) as it seeks to increase respondents' trust, reduce the perceived cost of responding and increase its completion rate.

Results and Data Analysis

In total, 182 usable questionnaires were received (out of the 255 that were sent)[6], for a response rate of 71.3%. Two graduate students separately coded all questionnaires into Excel. Then, the two data files were overlapped into a third spreadsheet to identify any coding errors. For each error identified, the original questionnaire was checked and the correct answer entered. Table 5 provides descriptive characteristics of the sample. As can be seen, the sample exhibited considerable variation in terms of project manager gender, age, experience and expertise, and the duration and size of the projects, providing support for the sample's representativeness.

Respondent Characteristics (N=182)					**IS Project Characteristics (N=363)**				
Descriptions	**Mean**	**S.D.**	**Min.**	**Max.**	**Descriptions**	**Mean**	**S.D**	**Min.**	**Max.**
Gender	F = 56 ; M = 126				**Project duration (months)**	14.9	9.96	2	60
Age (in years)	42.7	8.91	25	68	**Project size (person-days)**	6369	17005	75	132000
Nb. of years of experience in ISP management	11.2	6.64	1	35	**Nb. of individuals who worked in the project**	31	64,92	3	1000
Nb. of managed ISP	22.9	46.36	2	200	**Proportion of projects in the private sector**	68.7%	---	---	---
% with PM certification	51%								

Table 5. Characteristics of the Respondents and IS Projects

Construct Reliability and Validity

The 182 usable questionnaires provided data on 364 ISPs. From these, 18 projects were discarded due to missing data, yielding a final sample of 346 ISPs. The unidimensionality of all constructs (measured with reflective items) was examined via exploratory factor analysis and Varimax rotation using the PASW Statistics 18 (SPSS) package. As all items clearly loaded on their respective dimensions[7], scales were created for each construct by averaging its item scores. The Cronbach alphas (Alpha) of the risk and performance constructs (see Table 6) exceeded the recommended minimum value of 0.7 (Hair et al. 2005; Nunnally 1978).

Constructs	**Mean**[8]	**S.D.**	**Alpha**	**Pro. Per.**	**Out. Per.**	**Sat. Per.**	**Glo. Per.**	**Env. Risk**	**User Risk**	**Req. Risk**	**Com. Risk**	**Soc. Risk**	**Tec. Risk**
1. Process Performance (Pro. Per. -- 2 items)	3.11	1.11	.722[9]	1					**Legend**				
2. Outcome Performance (Out. Per. -- 2)	4.25	1.20	.737	.223**	1				**Significant at p=0.01 (two-tailed); *Significant at p=0.05 (two-tailed).				
3. Satisfaction Performance (Sat Per. -- 5)	4.68	1.32	.916	.418**	.636**	1							
4. Global Performance (Glo. Per. -- 9)[10]	12.03	2.87	.893	.672**	.796**	887**	1						
5. Organizational Env. Risk (Env. Risk -- 4)	4.16	1.60	.786	-.151**	-.053	-.248**	-.195**	1					
6. User Risk (User Risk -- 3)	3.37	1.62	.883	-.276**	-.138*	-.354**	-.327**	.435**	1				
7. Requirement Risk (Req. risk -- 3)	4.27	1.80	.894	-.417**	-.244**	-.445**	-.468**	.342**	.443**	1			
8. Project Complexity Risk (Com. Risk -- 4)	4.02	1.66	.838	-.183**	-.123*	-.137*	-.185**	.152**	.210**	.160**	1		
9. Social Risk (Soc. Risk -- 7)[11]	3.82	1.38	.819	-.237**	-.111*	-.347**	-.298**	.887**	.799**	.454**	.219**	1	
10. Technological Risk (Tec. Risk – 7)[12]	4.13	1.33	.783	-.369**	-.233**	-.355**	-.403**	.307**	.402**	.696**	.820**	.416**	1

Table 6. Cronbach Alphas and Construct Correlations

[6]Nonresponse bias was tested via two post-hoc techniques (Furneaux and Wade 2011): (1) early and late respondents were compared on substantive variables and (2) follow-ups were conducted with non-respondents to assess the reasons for nonresponse. The results suggest that nonresponse bias was unlikely and that respondents could be pooled with no loss in generalizability.

[7] Due to space limitation, the item cross loadings are not shown here, but can be provided on demand.

[8] All scales are on 7 points, except "Global Performance", which is on 21 points.

[9] Following Hulin et al. (2001), the standardized Cronbach's alpha for a two item scale was estimated as: $\alpha = Kr / (1+(K-1)r)$, where "K" is the number of components, i.e. 2, and "r" is correlation coefficient between the two items.

[10] Global performance is the average score of process performance, outcome performance and satisfaction.

[11] Based on Wallace et al. (2004a), the social risk measure is a composite of the user and organization environment items.

[12] Based on Wallace et al. (2004a), the technological risk measure is a composite of the requirement and project complexity items.

Step #1: Key ISPT Governance Attributes Identification

Since the ISPT governance attributes were empirically tested here for the first time, a first step of our exploratory study was to identify the key ISPT governance attributes that captured the essence of ISPTM styles. To do so, a profile deviation approach was applied. Following the procedure used by several researchers (e.g. Barki et al. 2001; Venkatraman and Prescott 1990), ideal profiles were identified from the sample of 346 ISPs. Four ideal profiles were established, one for each of the four performance variables: process performance, outcome performance, satisfaction and global performance.

In profile deviation studies, ideal profiles are calibrated using the highest performing 10% to 15% of the respondents in a data set (Vorhies and Morgan 2003). Thus, for example, the average ISPT governance attribute scores of the projects that best performed in terms of "process performance" formed the "process performance ISPTM style", i.e. the ideal profile that represented the "best" way to manage ISPT when the objective is to maximize process performance. For the 85% to 90% of the remaining respondents of the sample, a Euclidean distance was calculated (Barki et al. 2001) between the score of the ideal ISPTM style and the score of each project. This calculation yields a profile deviation score that represents the degree to which the ISPTM style deployed in a particular project is similar to the "ideal" ISPTM style.

Next, the impact on performance of the "extent of closeness to the ideal ISPTM style" was assessed. A distance score was individually calculated for each of the three ISPT process categories on each of the ISPT governance attributes. The profile deviation score of each ISP was then correlated with the four performance variables (Barki et al. 2001). Deviations from the ISPTM styles that significantly and negatively correlate with performance variables would provide supporting evidence for the validity and utility of the proposed ISPTM styles. The calculation of the individual distances for each ISPT governance attribute on each of the three ISPT process categories was repeated for each of the four performance variables and yielded a 3x4 correlation matrix.

The results suggested that a combination of the three following ISPT governance attributes yielded the highest number of negative and significant correlations: *(1) relative decisional rights distribution between stakeholders (SK) and the project manager (PM)*[13] *(i.e. centralization); (2) the level of control*[14]*, (3) the team member's (TM) level of cooperativeness in decision making (i.e. cooperativeness)*. Due to the exploratory nature of the study and since these three ISPT governance attributes seem to capture the essence of ISPTM, only these three attributes were retained for further analysis.

Step #2: Fit between ISP Risk Profiles and ISPTM Styles

To examine the effects of the fit between ISPTM styles and ISP risk profiles on performance, we first established the risk profile of each ISP by calculating their social and technological risk levels. To do so, the complete sample was used to calculate the medians of social risk (SR) and technological risk (TR), which were 3.857 and 4.0, respectively. Then, each ISP was classified, based on its SR and TR scores, into one of the four risk profile category as follows:

1. **Challenging** → SR >= 3.857 and TR >= 4.0.
2. **Easy (cookie cutter)** → SR < 3.857 and TR < 4.0
3. **Diplomatic** → SR >= 3.857 and TR < 4.0
4. **Technical** → SR < 3.857 and TR >= 4.0

[13] The relative decisional rights distribution between SK and PM is calculated by dividing the percentage of SK's decision rights by the percentage of the PM's decision rights.

[14] The eight governance attributes, empirically tested for the first time, were examined via an exploratory factor analysis. The results show a clear and interpretable pattern formed by four attributes: formalization, standardization, behavioral directives and outcome directives. This result is plausible as these attributes represent mechanisms that project managers use to ensure that team members act in a manner that is consistent with the project's objectives. A new scale labeled "Level of control" was created by averaging their scores and its Cronbach alpha exceeded the recommended minimum value of 0.7.

Next, the IPSs in each category were further classified as either successful or less successful based on the respondents' categorization (see Table 7).

Technical Projects (N=63)		**Challenging Projects (N=118)**	
Successful	**Less Successful**	**Successful**	**Less Successful**
N = 33	N = 30	N = 34	N = 84
Easy (cookie cutter) Projects (N=104)		**Diplomatic Projects (N=61)**	
Successful	**Less Successful**	**Successful**	**Less Successful**
N = 77	N = 27	N = 31	N = 30

Table 7. Number of Projects in each Risk Profile Category

Then, in order to identify the ideal ISPTM styles of each risk profile category, the ISPTM styles of successful and less successful projects were obtained by following the same analysis steps as described above. To verify that the ISPTM styles in successful and less successful projects were different, two-tail t-tests were done for the governance attributes in each process category (Hair et al. 2005), and the results are shown in Tables 8 to 11 with the key governance attributes of each ISPTM styles printed bolded and italicized. Each project manager's ISPTM style can vary according to the governance attributes that characterize each ISPT process. While the levels of some governance attributes can vary from one ISPTM style to another, they can be very similar for others. However, it is the combination of all the ISPT processes and governance attributes associated with a particular ISPTM style that differs between different styles (George and Bennett 2005).

Tables 8 to 11 suggest that, in each ISP risk profile category, project managers in successful ISPs deployed ISPTM styles which were different than those deployed by project managers in less successful ISPs since, for each ISPTM style, the levels and the combinations of the ISPT processes and governance attributes differed. For example, in "challenging" ISPs, the project managers of successful ISPs, had: 1) a higher level of control over planning and transition processes (P&T); 2) a lower level of relative decisional rights distribution over the P&T and the interpersonal processes; 3) a higher level of cooperativeness of decision-making regarding the P&T and the action processes, than the managers of less successful ISPs (Table 9).

In addition, the results of Tables 8-11 facilitate the comparison of not only the different ISPTM styles, but also of the ISPT processes. For example, while in the case of "challenging" ISPs five governance attributes seemed to make a difference between successful and less successful ISPs, only two attributes seemed to make a difference for "diplomatic" ISPs. Further, eight of the 15 significant results found in Tables 8-11 can be seen to pertain to planning and transition processes, which highlights their importance in managing ISPs.

To examine the influence of the fit between ISPTM styles (Tables 8-11) and ISP risk profiles on project performance, correlations between performance measures and profile distance scores were calculated. Here, the same analysis steps described above, were followed. First, for each type of risk profile category, an ISPTM style was established based on the top 10 to 15 % projects in terms of global performance. Next, individual profile distance scores were calculated for the remaining 85% to 90% ISPs. Finally, correlations between the profile deviation scores and the different performance variables were calculated (Table 12).

	IS Project Risk Profiles			
Performance Measures	**Easy** (cookie cutter)	**Technical**	**Diplomatic**	**Challenging**
Process	-.047	-.332*	.007	.142
Outcome	-.241*	-.228	-.441**	-.230*
Satisfaction	-.298**	-.175	-.168	-.211*
Global	-.261*	-.302*	-.308*	-.137

Table 12. Effects of fit between ISP risk profiles and ISPTM Styles on Performance
(** = p < .01; * = p < .05)

The results of Table 12 indicate that, generally, deviations from ideal ISPTM styles were significantly and negatively correlated with performance measures, providing support for the proposed contingency model of Figure 3.

Governance attributes	SUCCESFUL (N =33)		t-test		LESS SUCCESFUL (N=30)	
	Mean	S.D	T	P	Mean	S.D
PLANNING AND TRANSITION						
1. Level of control	***5.49***	***1.00***	4.13	**	4.26	1.34
2. Rel. D.Rights	***0.67***	***0.75***	-2.16	*	1.19	1.13
3. Cooperativeness	5.16	1.51	1.46	ns	4.53	1.85
ACTION						
4. Level of control	***5.23***	***1.21***	2.35	*	4.54	1.09
5. Rel. D.Rights	0.42	0.60	-0.47	ns	0.49	0.47
6. Cooperativeness	5.53	0.95	1.94	ns	4.97	1.33
INTERPERSONAL						
7. Level of control	2.98	1.35	1.54	ns	2.50	1.06
8. Rel. D.Rights	***0.25***	***0.41***	-2.99	**	0.82	1.02
9. Cooperativeness	4.52	1.50	-0.15	ns	4.57	1.28

Table 8. ISPTM Style for TECHNICAL IS Projects

Governance attributes	SUCCESFUL (N =34)		t-test		LESS SUCCESFUL (N=84)	
	Mean	S.D	T	P	Mean	S.D
PLANNING AND TRANSITION						
1. Level of control	***4.79***	***1.17***	2.09	*	4.30	1.15
2. Rel. D.Rights	***.074***	***0.99***	-2.38	*	1.37	1.41
3. Cooperativeness	***5.15***	***1.62***	2.63	**	4.37	1.39
ACTION						
4. Level of control	4.93	1.00	1.85	ns	4.55	1.02
5. Rel. D.Rights	0.57	0.66	-1.76	ns	1.00	1.39
6. Cooperativeness	***5.32***	***1.32***	2.03	*	4.76	1.38
INTERPERSONAL						
7. Level of control	3.24	1.25	1.43	ns	2.89	1.15
8. Rel. D.Rights	***0.43***	***0.52***	-2.52	*	1.22	1.79
9. Cooperativeness	4.79	1.25	1.82	ns	4.27	1.47

Table 9. ISPTM Style for CHALLENGING IS Projects

Governance attributes	SUCCESFUL (N =77)		t-test		LESS SUCCESFUL (N=27)	
	Mean	S.D	T	P	Mean	S.D
PLANNING AND TRANSITION						
1. Level of control	***5.20***	***1.11***	3.30	**	4.31	1.44
2. Rel. D.Rights	0.49	0.52	-1.31	ns	0.93	2.86
3. Cooperativeness	5.53	1.21	1.22	ns	5.19	1.44
ACTION						
4. Level of control	***5.24***	***1.10***	3.01	**	4.46	1.32
5. Rel. D.Rights	0.29	0.36	-0.50	ns	0.33	0.36
6. Cooperativeness	5.22	1.45	-0.12	ns	5.26	1.35
INTERPERSONAL						
7. Level of control	2.69	1.32	1.20	ns	2.34	1.19
8. Rel. D.Rights	***0.28***	***0.56***	-2.26	*	0.72	1.22
9. Cooperativeness	***4.64***	***1.51***	2.52	*	3.73	1.82

Table 10. ISPTM Style for EASY (COOKIE CUTTER) IS Projects

Governance attributes	SUCCESFUL (N =31)		t-test		LESS SUCCESFUL (N=30)	
	Mean	S.D	T	P	Mean	S.D
PLANNING AND TRANSITION						
1. Level of control	***4.98***	***0.90***	2.03	*	4.47	1.08
2. Rel. D.Rights	0.88	13.19	1.34	ns	1.12	17.29
3. Cooperativeness	***5.29***	***1.49***	2.43	*	4.33	1.58
ACTION						
4. Level of control	5.15	0.98	0.96	ns	4.92	0.88
5. Rel. D.Rights	0.70	1.12	0.02	ns	0.70	1.10
6. Cooperativeness	5.35	1.54	0.79	ns	5.07	1.31
INTERPERSONAL						
7. Level of control	3.53	1.31	1.26	ns	3.13	1.22
8. Rel. D.Rights	0.46	0.66	-0.44	ns	0.54	0.65
9. Cooperativeness	4.94	1.59	0.83	ns	4.60	1.57

Table 11. ISPTM Style for DIPLOMATIC IS Projects

Note: Two-tail T-test: ** = p < .01; * = p < .05; ns = none significant.
Rel. D.Rights = Relative Decisional Rights distribution between Project Manager and Other Project Stakeholders. **Cooperativeness** = Cooperativeness of decision-making with Team members

DISCUSSION AND CONCLUSION

The present study had two main objectives: 1) to identify ISPTM styles, and 2) to determine if some styles were better suited to certain types of ISP risk profiles. ISPTM styles were conceptualized here as configurations of different key ISPT processes and governance attributes. The results of Tables 8 to 11 suggest that, as hypothesized, different ISPTM styles do seem to exist among practicing ISP managers. These results are interesting because they show that, depending on the type of ISP risk profile, a project manager is likely to adapt his/her management style. They also show that there are important differences between the ISPTM styles deployed in successful ISPs compared to less successful ISPs. This provides support to the idea that the "one size fits all" (Shenhar 2001) approach is probably not the most appropriate way to manage ISPT. It also suggests that a more holistic and configuration perspective of ISPTM can be useful for providing new insights and enrich our understanding of ISP management.

Further, the mostly significant results of Table 12 regarding the impact on ISP performance of the fit between different ISPTM styles and ISP risk profiles also provide an important step in the development of a typological theory of ISPTM styles (George and Bennett 2005). As suggested in Table 12, the closer an ISPTM profile deployed by a project manager was to an "ideal" ISPTM style, the higher was the ISP's performance on specific measures. For instance, in the context of easy (cookie cutter) projects, the closer the ISPTM profile deployed by an ISP manager was to the "ideal" ISPTM style of cookie cutter ISPs, the higher was the project's performance in terms of outcomes, stakeholder satisfaction and global performance. Thus, depending on the characteristics of an ISP and its context (which can be described via risk factors), certain management strategies or styles seem to be better suited than others. Thus, it would be interesting in future research to examine other contingencies which might affect ISPTM styles, such as task interdependence (Sharma and Yetton 2003) and goal conflict (Andres and Zmud 2001), as well as examining how ISPTM styles change throughout the various phases of an ISP (Kirsch 2004).

The present study also identified three key ISPT governance attributes that seemed to capture the essence of ISPTM: 1) relative decisional rights distribution between stakeholders and the project manager; 2) level of control and 3) team members' level of cooperativeness in decision making. Identifying the relative distribution of decision rights as a key attribute constitutes an interesting finding as it is directly aligned with Rowley's view (1997) that, when trying to understand a group's functioning, it is important to look at the balance of power or decision rights between stakeholders, and not only at who has decision rights. The level of control also seems to make sense as a key governance attribute since in any ISP, even in agile projects (Schwaber and Jeff Sutherlan 2011), minimal levels of formalization, and a certain standardization of behavioral and outcome directives are required (Kirsch 2004; PMI 2013). The cooperativeness of team members also makes sense since, to make a decision, a project manager needs to have valid and precise information on the project's progress, with the team members being the best positioned to provide such information (Henry et al. 2003).

Given the relatively exploratory nature of the present study, its results need to be interpreted in light of its limitations. A first limitation stems from the cross-sectional nature of the study which limits our ability to explore how ISPTM styles unfold over time or throughout life cycle stages. Second, the ISP performance measures were based on project managers' own assessments and were therefore subjective. Although self-evaluation of performance has been widely adopted in ISP research, self-perceptions of success may provide biased evaluations. Finally, the potential effects of industry characteristics (e.g. technology versus manufacture) and the complexity of projects could not be considered in the interpretation of results.

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